THE
BOSTON MEDICAL AND SURGICAL
JOURNAL.

VOL. IX.] WEDNESDAY, DECEMBER 18, 1833. [NO. 19.

AN ESSAY ON AUSCULTATION AS APPLIED TO CARDIAC DISEASES,

CONTAINING A NEW HYPOTHESIS REGARDING THE SOUNDS OF THE HEART.

BY CHARLES HOOKER, M.D.

[Communicated for the Boston Medical and Surgical Journal.—Continued from p. 286.]

A New Hypothesis.—THE concurrent views of the older physiologists generally, with those of Mr. Turner, Dr. Hope, and some other recent experimenters, it is thought, fully warrant the following conclusions, viz.

1st. The first motion of the heart, after the period of repose, is the auricular systole, which is a slight motion, attended with no perceptible sound or impulse.

2nd. The systole of the auricle is immediately followed by that of the ventricle, which is synchronous with the impulse, the first sound, and the pulse in the arteries near the heart.

3rd. The ventricular diastole immediately follows its systole, and is synchronous with the second sound.

4th. The period of repose occurs after the ventricular diastole, and before the recurrence of the auricular systole.

These conclusions may be regarded, not as hypothetical, but as principles legitimately deduced from the observation of facts; and, from the synchronism of actions and phenomena, it is reasonably inferred that the first sound, the impulse, and the arterial pulse, are, in some way, *caused* by the ventricular systole; and that the second sound is caused by the ventricular diastole.

The immediate cause, or the philosophy, of these phenomena, it has appeared to me, is most satisfactorily explained by attributing the sounds to the action of the cardiac valves—the first sound to the occlusion of the auriculo-ventricular valves; the second to that of the arterial or sigmoid valves. The impulse also appears attributable, in part, to the action of the valves, and not wholly, as is commonly supposed, to the striking of the apex of the heart against the ribs. This hypothesis, it is believed, has not been advanced by any of the numerous writers, whose attention has been directed to this subject; it will certainly be found, however, to afford a rational explanation of both the natural and pathologic phenomena of the heart's action.*

---

* As stated in a Remark prefixed to this Essay, it appears from the London Medico-Chirurgical Review, for April 1833, that a similar explanation of the sounds of the heart has been given by Dr. Rouanet (of Paris, it is supposed), and Dr. Billing of London. That Journal, which contains only a brief notice of the views of each of those gentlemen, was not published in London until several months after the views contained in this Essay were communicated publicly to the class in the Medical Institution of Yale College, as well as privately to Drs. Hubbard, Knight, Beers, Denison, and

This hypothesis may be summarily stated in the following propositions.

1. During the ventricular systole, a regurgitation of blood from the ventricles into the auricles is prevented by the occlusion of the auriculo-ventricular valves; which occlusion of the valves, with the consequent sudden arrest of the incipient regurgitation, is the principal cause of *the first sound.*

2. *The second sound* is caused by a similar occlusion of the arterial (or sigmoid) valves, by which the incipient regurgitation, from the arteries into the ventricles, is suddenly arrested, during the ventricular diastole.

3. *The impulse* is a concurrence of two distinct actions; 1st. A *heaving motion*, caused by the apex of the heart striking against the ribs; and 2nd. A sudden *vibratory succussion*, caused by the occlusion of the auriculo-ventricular valves. These two actions are ordinarily simultaneous, and not distinguishable; but, in many cases of disease, they may be distinguished, with an appreciable interval between their times of occurrence.

4. *The back stroke*, of Dr. Hope (*auricular impulse*,[*] of Laennec), is a sudden *vibratory succussion*, synchronous with the second sound, and caused by the occlusion of the arterial (or sigmoid) valves.

To the occlusion of the cardiac valves, then, I attribute both the sounds of the heart, and the vibratory succussions attending these sounds. This supposed agency of the valves, constitutes the leading principle of my hypothesis—a principle, which, if proved true, will throw new light on the investigation of the physical signs, and give additional precision to our diagnosis, in cardiac diseases.

The following considerations appear to favor this hypothesis.

1st. The phenomena attributed to the valves, occur at the moment when the occlusion of the valves may be supposed to take place.

2nd. The character of the phenomena is such as might be expected from the situation, construction, and action of the valves.

3rd. This hypothesis rationally explains the phenomena produced by disorders of the heart, and especially those produced by derangement of the valves.

1. *The phenomena attributed to the valves occur at the moment when the occlusion of the valves may be supposed to take place.*

The situation and construction of the several valves, plainly indicate their principal office—to prevent a regurgitation of blood into the cavities, at the outlets of which they are severally placed. This regurgitation into each of the several cavities, would obviously occur, at the moment when the diastole of the cavity commences, after the completion of its systole. It is at this moment, therefore, that the occlusion of the valves is required—that of the auriculo-ventricular valves, at the moment of the auricular diastole; and that of the arterial valves, at the moment of the ventricular diastole.

It is pretty generally conceded, that the auricular diastole does not

---

other medical friends, of this city. The fact, that the hypothesis originated, about simultaneously, from three independent sources, is a circumstance which certainly does not weigh against the truth of the hypothesis.

[*] From his erroneous hypothesis, that the second sound was caused by the auricular systole.

occur, until some little time after the commencement of the ventricular systole. Lancisi observes, that "the middle of the systole of the auricles is synchronous with the beginning of the systole of the ventricles; and the end of the systole of the auricles coincides with the middle of the systole of the ventricles." Mr. Turner, after quoting the opinions of the older physiologists on this point, remarks, that, according to his own observations, the contraction of the auricles "was followed so immediately by that of the ventricles, that he has found it very difficult, if not impossible, to distinguish any interval between them." And Dr. Hope observes, that the systole of the auricles terminates in that of the ventricles "rather by continuity of action, than by two successive movements." According to these observations, it is evident, that, at the commencement of the ventricular contraction, each auricle, and its corresponding ventricle, together, constitute one contracting cavity; for, while the auricular contraction is prolonged, the current of blood from the auricle into the ventricle, must prevent the occlusion of the auriculo-ventricular valves.

This prolongation of the auricular contraction probably continues, until, by the ventricular contraction, the apex of the heart is tilted forwards against the ribs, causing the *heaving motion* of the impulse. At this moment, the auricular systole being finished, its diastole occurs, attended, necessarily, with an occlusion of the auriculo-ventricular valves. It is at this moment, also, that the *first sound* and the *first vibratory succussion* occur—produced, as I suppose, by the occlusion of the valves.

It is thus that the first sound, and the vibratory succussion and heaving motion of the impulse, are commonly synchronous. In some cases, however, these several phenomena do not occur at the same instant. Various authors relate cases in which the impulse and first sound are not synchronous. In hydro-pericardium, the first sound, with the vibratory succussion, commonly precedes the heaving motion of the impulse. In such cases, I have supposed that the apex of the heart, its movement being retarded by the water in the pericardium, did not strike against the ribs, until subsequent to the occlusion of the valves.

That the *second sound*, with the *second vibratory succussion* ("back-stroke"), occurs at the same time with the occlusion of the arterial valves, will hardly admit of doubt. It has been fully shown by experiment and observation, that the second sound accompanies the diastole of the ventricles, an action which Dr. Hope and others describe as "an instantaneous motion"; and the situation and structure of the arterial valves, render it obvious, that, during this "instantaneous" diastole, an occlusion of the valves must occur.

2. *The character of the phenomena is such as might be expected, from the situation, construction, and action of the valves.*

The second sound. The mechanism, which, according to my views, produces the second sound, is much more simple than that which produces the first sound. The sigmoid, or arterial valves, are short, firm, and fitted to close a regular, circular orifice—the coats of the artery, to which the valves are attached, are of a more dense, rigid and elastic texture, than the parietes of the heart, to which the auriculo-ventricular valves are attached—and the sigmoid valves are moved by one single cause, the current of blood in the artery. During the ventricular systole, the valves are kept open by the onward current of the blood through the arterial orifices. At the close of the ventricular systole, its instantaneous diastole occurs, which would be attended with a rapid regurgitation from the arteries into the ventricles, were it not for the fact that the refluent blood suddenly closes the arterial valves.* This occlusion of the valves, with the sudden check thus given to the incipient rapid regurgitation, might be expected to produce a short, sharp, clacking sound, such as actually occurs at this moment—a sound well described by Laennec, as "a noise resembling that of a valve, or a whip, or the lapping of a dog."

The first sound. The auriculo-ventricular valves are of a more complicated mechanism, than the arterial valves. The orifices which they close, are larger and more irregular—the margins of the valves are longer, and the whole valves are larger, and more flaccid, than the arterial valves—the valves are moved, principally at least, by the current of blood, but their motions are regulated by the action of the columnæ carneæ—these columnæ are attached to the movable parietes of the ventricles, and their positions consequently change with the motions of the ventricles—the systole of the ventricles, which occasions the reflux of the blood from the ventricles towards the auricles, is a much less rapid motion than their diastole, which, by its suction power, aided by the reaction of the distended, elastic arteries, occasions the reflux of the blood from the arteries towards the ventricles—and, the occlusion of the auriculo-ventricular valves must be opposed by the blood, with which the auricles are always nearly filled; whereas, the arterial valves close at the moment when the ventricles have just been nearly emptied by their systole.

From a consideration of these circumstances, it is obvious that the reflux of the blood from the ventricles towards the auricles, must be less rapid than that from the arteries towards the ventricles; and, that the occlusion of the auriculo-ventricular valves, must be less sudden than that of the arterial valves—and, consequently, the sound produced by the occlusion of the auriculo-ventricular valves, is comparatively "more dull and prolonged."

It has appeared to me, however, that, blended with the *clacking sound*, which I attribute to the occlusion of the valves and the sudden arrest of the incipient regurgitation, other obscurer sounds are occasioned by the ventricular systole—that is, the first sound appears to be a union of several sounds, produced by different causes.

At the moment of the heaving motion of the impulse, an obscure *dull sound* occurs, like that produced by the collision of two soft bodies —and which seems attributable to the striking of the apex of the heart against the thoracic parietes. Commonly, this dull sound is perfectly synchronous with the clack; but, in those cases in which the first sound

---

* It is immaterial to this question, whether we suppose the ventricular diastole to be produced by a "muscular diastolic action," or a simple "mechanical elasticity." Indeed, independent of all hypothesis, the very structure of the valves clearly indicates, that their action is to prevent a regurgitation from the arteries into the ventricles.

(or the clacking portion of it) does not coincide with the impulse, as in hydro-pericardium, the dull sound attending the impulse may be observed distinct.

There is also, during the ventricular systole, an obscure, prolonged *rushing sound*, which is probably occasioned by the motions of the blood. It is to this cause, that Dr. Hope thinks the phenomena of the first sound wholly attributable. By the ventricular systole, he thinks, the blood "is thrown into an infinity of conflicting currents," and "the vibratory collision thus occasioned among the particles of blood, produces sound." I cannot conceive that these motions of the blood are sufficiently sudden to cause the abrupt clack, which is the prominent portion of the first sound; but, that the motions of the blood may produce audible sounds, is evident from the *murmurs*, which occur in cases of contraction of the cardiac orifices, and in other affections. Many, indeed, of these morbid murmurs, might probably be considered as mere variations of this obscure rushing noise, which is ordinarily observable in listening to the sounds of the healthy heart. It is not improbable, however, that this rushing sound is, in part at least, owing to the friction of the heart against the pericardium.

In many cases, the ear is not able to analyze the first sound of the heart, so as to distinguish these three different concurring sounds—especially in children, and, in general, when the heart's action is frequent and quick. There are cases, however, in which they may all be distinctly observed—as in cases of liquid effusion in the pericardium, attended with a slow, unfrequent action of the heart. In such cases, the clack occurs before the apex of the heart strikes against the ribs; then the blow of the apex produces the dull sound; and this is followed by the rushing sound, which is prolonged until the occurrence of the second sound.

The impulse and back-stroke. The mechanism of the heart renders it obvious, that the occlusion of the valves must produce a sudden arrest of an incipient regurgitation, at the several orifices, which they close. This sudden arrest of the refluent blood, might be expected to produce a considerable shock, or vibratory succussion. Two such vibratory succussions, the one attending the systole, the other the diastole, of the ventricles, are distinctly perceptible to the fingers, applied directly to the pulsating heart, or to a large artery near the heart.

A moment's reflection must satisfy any auscultator, whose attention is turned to this point, that the common explanation of the impulse is inadequate to account for the whole phenomenon. Undoubtedly the striking against the ribs of the apex of the heart, during its systole, does cause a succussion, or impulse—a "sensation of pressure or percussion communicated to the ear." That fact is evident from the statements of experimenters, who have felt a smart blow, communicated by the apex of the heart, to the hand held between the heart and the parietes of the chest, of a living animal. But it is manifest, from the statements of these same experimenters, that this blow of the apex does not explain *all* the phenomena of the impulse. Dr. Hope, who ascribes the impulse wholly to this cause, says, notwithstanding, that when the thorax of an ass was laid open, so as to expose the pulsating heart to the sight and touch, and while the stethoscope and the hands were applied immediately to the organ, "the ventricular systolic sound and the impulse were heard, seen, and felt both by the ear and hand, to be simultaneous." (Hope's Treatise, p. 24.) Again (p. 27), he says, "while the ear rested on the stethoscope, applied to the middle of the ventricle, the impulse was felt by the auscultator to coincide with the systole, *notwithstanding that the body of the ventricle appeared to be receding at the moment the impulse took place.*"

This *vibratory succussion* of the impulse may be observed, not only when the apex of the heart is suffered to impinge against the ribs, but also when the ribs are drawn aside, so that the apex, in its motions, meets with no solid obstacle. It is distinctly felt, with each ventricular systole, when any portion of the heart is grasped in the hand—being a sudden, strong, vibratory concussion, or jar, evidently depending on some internal action, or motion, of the heart—occurring at the same instant, and most obviously produced by the same cause, as the first sound.

A similar vibratory succussion attending the second sound, is felt, when the pulsating heart is held in the hand. This, also, evidently depends on some internal action of the heart—the same action that produces the second sound. When this is propagated to the surface of the chest, it constitutes the *back-stroke* of Dr. Hope (the *auricular impulse* of Laennec), and is a pathognomic sign of considerable importance.

These vibratory succussions are such as might be expected to result from the occlusion of the valves. At the moment of the occlusion of the auriculo-ventricular valves, which, as before explained, does not occur until after the ventricular systole is somewhat advanced, the arteries have already become considerably distended, by the influx of the blood from the contracting ventricles. The reaction of the elastic, partially distended arteries, therefore, with the progressing ventricular contraction, must cause a very forcible and abrupt occlusion of the auriculo-ventricular valves—and the sudden arrest of the refluent blood, with the reaction of the valves, the chordæ tendineæ, and the columnæ corneæ, might be expected to produce a considerable jar, or vibratory succussion.

A similar vibratory succussion might be expected to result from the occlusion of the arterial valves, at the moment when the fully distended arteries are reacting on the refluent blood, which is abruptly arrested by the occlusion of the valves.

These two vibratory succussions, which I attribute to the valves, appear to have considerable agency in producing the phenomena observed *in feeling the pulse*—the vibrations being propagated through the whole column of blood in the arterial system. In making experiments with living animals, I have observed that the two succussions are distinctly perceptible in the aorta, held between the thumb and finger. At the commencement of the ventricular systole, the aorta is felt to swell slightly, and, immediately, a sudden jar, throb, or vibratory succussion, is felt, both in the heart and the aorta, attending the diastole of the aorta. At this instant, the current of blood in the aorta seems suddenly accelerated, as though impelled by a violent blow. Again, at the commencement of the ventricular diastole, a similar, though slighter and more sudden, vibratory succussion is observed, attending the systole of the aorta. In very lean persons, these two succussions are distinctly perceptible, with the finger applied to the neck, over the carotid artery, and, in many cases of disease, they are both perceptible in the pulse of the radial artery—the second, slighter succussion, or throb, appearing to be a kind of reverberation of the first.*

General Observations.—The preceding explanation rationally accounts for the phenomena observed, with the stethoscope applied to the precordial region. After the period of repose, an obscure rushing noise is first heard, and, as the apex impinges against the ribs, the stethoscope is gently crowded against the ear, and, at the same instant (the moment of the auricular diastole, and the occlusion of the auriculo-ventricular valves), occurs a sudden vibratory succussion, with a clack not unlike the second sound, though rather more dull and prolonged—continued through this clacking sound, the rushing noise is prolonged, until abruptly terminated (with the ventricular diastole, and the occlusion of the arterial valves) by the single clack, which constitutes the short and sharp second sound.

The changing positions of the heart obviously account for the points, in which the various phenomena are most perceptible. The systole of the ventricles, commencing before the completion of the auricular systole, causes the apex to be tilted against the ribs, so that, at the moment of the occlusion of the auriculo-ventricular valves, the firmly-contracting ventricles, with the contained blood, constitute a dense conducting medium, between these valves and that portion of the thoracic parietes, over which the first sound and vibratory succussion are most perceptible—that is, about the cartilage of the sixth left rib, and near the lower end of the sternum. On the contrary, the apex of the heart having retired from the thoracic parietes, before the occurrence of the second sound, this sound is most audible at a point about one and a half or two inches above—that is, directly over the arterial valves.

This circumstance, that the arterial valves close after the apex of the heart has retired from the ribs, accounts for the fact, that, ordinarily, no vibratory succussion (back-stroke) is observed attending the second sound—there being, at this instant, no dense conducting medium, between the arterial valves and the thoracic parietes. In some cases, however, the second sound is attended with a distinct vibratory succussion—a motion, which, Laennec says, " consists of a sort of trembling, felt deep within the mediastinum." This becomes perceptible, at the surface of the chest, from any cause which retains the heart in close apposition with the thoracic parietes, during the ventricular diastole, or which affords a dense conducting medium between the heart and the thoracic parietes. Mr. Turner states, that, in some instances, in which this " succussion could not be perceived, when the persons examined were in the erect posture, or lying on the back, it became observable by making them lie on the left side." Dr. Hope mentions the back-stroke, as one of the physical signs of "hypertrophy with dilatation"—erroneously, as I think, attributing the succussion simply to the "sinking back" of the heart "from the walls of the chest."

---

* I would not here dissent from the common opinion, that the principal phenomena of the pulse are occasioned by the dilatation, and by the " muscular," or " elastic," contraction, of the artery. I would only offer the conjecture, that these actions receive a jerking, or vibratory, character, from the reaction of the cardiac valves.

There is no disease, in which I have so constantly observed the occurrence of this second vibratory succussion, as in hydro-pericardium—a fact, which, I believe, is not mentioned by authors, but which I have found to furnish a valuable physical sign in this obscure disease. So, in cases of solidification of the lungs, or of liquid effusion in the cavities of the pleura, this succussion frequently becomes perceptible in regions of the chest remote from the heart.

In all of these cases, it will be observed, either the heart, by its gravity or size, is retained in apposition with the thoracic parietes, or a dense conducting medium exists between the organ and the thoracic parietes.

[To be continued.]

MEDICAL IMPROVEMENT.—NO. XII.

[Communicated for the Boston Medical and Surgical Journal.]

"We theorize before we know, and we establish prepossessions before we have collected and compared a sufficient range of facts and just inferences from them. But closer attention multiplying our knowledge, and making our reasoning correct, our later opinions become nearer the actual truth."*

"It is often because we do not sufficiently know our subject of discussion, that we most keenly dispute about it. Numerous difficulties arise in an active mind, on every point on which information is slender. It is ignorant of its ignorance, until it gets larger knowledge. The superficial are the most pugnacious; and we must be superficial before we can be well informed. Thus, in the best-intentioned minds, doubt and objection, controversy and disbelief, cannot but precede knowledge, judgment, right opinions, and a satisfied conviction."†

It is more frequent in medicine, than in most other subjects, that "a little learning is a dangerous thing." The danger arises from the *little* being mistaken for the *all* that is necessary to be known. Where this mistake is made, and the superficial man imagines that his information is complete, the obstacles to future improvement are nearly insuperable. The possessor of little knowledge generalizes from the few facts in his possession, and extends his general rules, so as to endeavor to make them universal laws. Resemblances strike us at first view, and a child readily recognizes likenesses; but it often requires close observation, and a series of accurate experiments, to detect differences, and to discriminate them in their important bearings. If the first things that happen to be noticed, or the first objects of practical attention, should be only exceptions to a general rule, they may be mistaken for the common law, and make such a partial impression, that their effect on the mind is with difficulty ever after obliterated.

The common people rarely trouble themselves much concerning the nature of disease or medicine, or have their attention turned to these subjects, except in severe, rare, and anomalous cases. A hundred instances of a few days' illness in their families, or among their friends, pass by unheeded, and are considered as matters of course. But, if a careless nurse stupifies a child by mistaking laudanum for paregoric, or a heedless patient becomes salivated while taking mercury, the neighborhood is in an uproar. Opium and mercury are now supposed to be the most dangerous articles, and the prejudice often arises to such extremes, it would seem, that death from disease is by many preferred to recovery under unpopular remedies. The difficulty arises from having little learning, and mistaking the exceptions for general rules.

---

* Vide Turner's Sacred History of the World. Letter 5.
† Vide idem. Letter 1.

Sydenham's epidemic of 1763, which bore but badly the operation of cathartics, would have been very likely to prejudice the young practitioner against the general rule that it is usually necessary to cleanse the alimentary canal, before most courses of treatment, especially in acute diseases, can be entered upon with advantage. Free depletion is so indispensable in entonic pneumonia, that those physicians whose personal knowledge of acute pulmonary affections is mostly limited to this form of disease, can scarcely credit, as a general rule, that in atonic pneumonia-typhodes bleeding is commonly a very doubtful, and in many instances a very decidedly injurious measure.

For almost every system, there are a few facts to give it countenance. It is all-important to ascertain whether these facts are only exceptions, or whether they are general rules, or whether they are universal laws. Here is where the greatest minds have stumbled—for want of sufficient knowledge, and from mistakes as to the degree of universality, in the application of known facts. Lavoisier and his followers supposed oxygen to be the universal principle of acidity. They were right as a general rule, but later discoveries have shown the law to be far from universal. Vaccination is still the most valuable protection known against smallpox; but it is now found not to be that absolutely complete shield, which its early discoverers at first imagined. All the voluminous disputes concerning oxygen and vaccination depended upon the degree of knowledge of the parties, and upon the imperfect information which, at the time, belonged to the various sides of these questions.

Science, in a philosophical point of view, implies both the knowledge and the arrangement of facts. Our information, to be the most useful, and to enable us to act with the most certainty, must be so classified that the relations of its parts may be seen, and their mutual dependence on each other may be readily traced. In this case, if knowledge is tolerably complete, it becomes a regular science. Otherwise, all our learning, without methodical arrangement, will resemble a voluminous commonplace book, without index or table of contents. It is from a want of proper arrangement, and a defect of right associations, as well as from limited and imperfect knowledge, that there is so much scepticism, as well as uncertainty, in medicine.

The student finds that the antiphlogistic regimen is the grand secret in treating smallpox. He also finds that the same disease is sometimes treated successfully by wine, cinchona, and opium, employed in the freest manner. Here, however, is no necessary clashing of testimony.

The former is the general rule, the latter the exceptions. If the writer has been clear in stating both, there is no difficulty. Sydenham's sheet anchor in dysentery was opium, and he was so sensible of its great utility, that he thanks the Supreme Being for such an inestimable gift. Zimmermann's great dependence, in the same disease, was upon cream of tartar and tamarinds. They were both men of the strictest integrity, and for anything that belongs to the question, may have been equally accurate in their observations. It is only necessary to consider the different epidemic constitutions in which they practised, to reconcile satisfactorily the discrepancy. An epidemic of this malady is said, about thirty years ago, to have prevailed in Maine, in which alkalies proved to be almost a specific. This fact does not necessarily clash at all with Zimmermann's acids, or with Sydenham's opium. All that we want to know, is the peculiar nature of the disease in which each of these methods was successful. Atonic heat, thirst, restlessness, delirium, and coma, are often best relieved by means which would aggravate such symptoms in entonic diseases; though there are sometimes intermediate cases, in which a very considerable diversity of treatment may change the morbid action, or condition, and thus remove the original complaint. To one who is acquainted with no method but his own, a different treatment may appear absurd or incredible. The ignorant man generalizes too much, and makes a bad classification—confounding things which have a slight similarity, but are essentially different in some important properties.

There is scarcely a chapter in the annals of medicine, from which numbers of curious facts of this kind may not be selected. They all show that a little knowledge is a dangerous thing, when it is mistaken for complete information, and that most disputes arise from the ignorance of one or both of the parties.

Most men are fully sensible of the advantages of what they know; but it is rare for them to appreciate the value of things which they do not understand. Even if some idea is formed of their practical utility, the pleasures arising from extensive knowledge can be only conceived by the possessor. To him, instead of being a tedious, ungrateful task, the acquisition of information is among the highest sources of enjoyment. When he is sensible that his learning is of the practical kind, and finds that it enables him to be of the greatest benefit to himself and others, he is in as happy a situation as this world can afford. We have already seen that benevolence and power are of very little advantage, unless they are guided by knowledge. Indeed, in everything except brute strength, there can be no power without information; nor can there be any pleasure, except of the transient, sensitive kind, where knowledge is wanting.

Literary, scientific, and professional men, when they are industrious and do their duty, as a body, are probably happier than any other classes of mankind. The reason is that they find their chief gratification in mental cultivation. They receive their pay while performing their labor. The means of enjoyment are always at hand, because a fund of knowledge can never become bankrupt. From there being no end to improvement and no limits to learning, they are always acquiring something new, and every further step they take is attended with the fascination of novelty. The studious physician has the additional satisfaction of being constantly able to bring his mental speculations to the test of practical utility, and sees and feels that his labors are productive of immediate good. He has always an opportunity for the exercise of benevolent feelings, and the understanding and affections are directed to the same interesting objects. That kind of mental excitement, which carries us above the ordinary ills of life, and makes us despise the petty vexations which so much annoy the happiness of others, is uniformly kept up, in the course of professional employment, when this is properly combined with a regular plan of study and habitual mental improvement. S.

SOME ACCOUNT OF SCARLET FEVER AS IT PREVAILED IN KENNEBEC COUNTY, MAINE, IN 1832-3.

[Communicated for the Boston Medical and Surgical Journal.]

This disease first made its appearance in Fayette in April, 1832. It had previously proved fatal in some adjacent towns, and caused a good deal of alarm amongst the people here. There had been nothing remarkable in the weather, except that the winter had been quite severe. The first family to whom I was called was attacked with great violence —six of the children were taken down with the disease nearly at the same time. These cases all exhibited highly inflammatory symptoms— thirst almost intolerable—skin burning hot and dry—fauces much inflamed—ulceration of same about 7th day—difficult deglutition—spontaneous ptyalism in several cases—and copious expectoration of tough viscid phlegm. The patients were emeticised at first; and occasionally, during the violence of the disease, were freely catharticized for several days— allowed acids and cold water for drink, and ice to hold in the mouth. Decoction of senega was freely given, and repeated doses of tinct. opii at night; indeed, there was no rest without the latter. During the febrile exacerbations, sponging with cold water and vinegar was tried, and appeared to be very grateful to the patients. A blister was applied to the throat in one case; ulceration succeeded, extended entirely around the neck, was exceedingly annoying to the patient, and was six weeks in healing. The cuticle appeared to be dead after the disappearance of the rash; in some, the cuticle of the hands and feet was detached almost entire. These patients all recovered—some in three weeks, some in as many months.

The disease prevailed through the summer and ensuing winter. There were about 150 cases in the whole, and about 20 deaths; nearly all among children under ten years of age. It was more severe in the fall than in the spring, and assumed more of a typhoid type. In the winter it became exceedingly severe, and was accompanied by pulmonic symptoms, though it appeared also in every form and type. Petechia and vibices showed themselves in a number of cases, two or three days before death took place.

At first it was thought by the people to be highly contagious; but at length that notion was given up, for some families had the disease who had been secluded and had not had any communication with others.

When it came into a family it generally went through with the children; but there were many exceptions to this, and some children who had been constantly exposed did not take the disease. It was generally confined to children—scarcely an adult had the rash, but an immense number had sore throats. Some young children, apparently in good health, were prostrated at once, in a few hours becoming totally insensible, having a thready pulse, a cool skin, a parched red tongue, and throat much swollen. These cases always proved fatal about the fifth day, let the treatment be what it might.

Some families had the disease so light that the children scarcely needed to be confined to the house or the care of a physician; hence other families were induced to believe they should do better without medical aid, and neglected to send until the disease had become formidable, and but little could be done but look on and see the destroyer devour his prey. Several died in 24 hours after the attack.

Secondary symptoms were not unusual, and in some cases more severe than the first attack; these were suppuration of the limbs, dropsical effusions, &c. &c.

In April last the disease suddenly left this vicinity, and through the summer of 1833 there have been but a few cases, and those very mild.

Treatment.—The people were much alarmed, and many physicians were called; almost every variety of treatment was tried—the antiphlogistic, the stimulant, the heating or steaming, and the refrigerant, with pretty much the same fatal result. Expectorants, emetics, cathartics, diuretics, &c., were used in vain. The truth is, no general rule could be adopted in such a variety of cases; and had every case been treated strictly according to its symptoms, in my opinion there would have been much less mortality. Notwithstanding, it seemed almost impossible to ameliorate the condition of very young children when attacked with the severer form of the disease. No post-mortem examinations were made. Some of the physicians believed the disease put on the type of cholera.

Fayette, Dec. 3, 1833. ARCHELAUS P. FULLER, M.D.

PAROTITIS.

To the Editor of the Boston Medical and Surgical Journal.

SIR,—I should like to be informed whether any of your correspondents have been enabled, by their observations, to settle in their minds some questionable points with regard to the common disease, Parotitis, or Mumps. Authors generally speak of the disease as contagious; but I cannot learn that any author attempts to fix the *period* for the appearance of the disease after exposure.

The following facts have recently come under my observation.

In the early part of November, I was myself attacked with mumps, without any known recent exposure to the disease, though it is said that several cases had previously occurred in town. In early life, I had been frequently exposed to the disease, in one instance sleeping in the room with a patient through the whole course of it, and, for several years past, I had professionally attended many cases.

Succeeding my own case, three other cases have occurred in my family—the first within two weeks and two days, and the other two within three weeks and one day, subsequent to my own attack. A young man, also, from a neighboring town, without any other known exposure, was attacked with the disease two weeks and five days after visiting me, and sitting with me about an hour, on the third day of my illness.

At the present time scattering cases are occurring in different parts of the town—in most instances, it is believed, without any known previous exposure to the disease. C.

December 7, 1833.

BOSTON MEDICAL AND SURGICAL JOURNAL.

BOSTON, DECEMBER 18, 1833.

USEFUL PROPERTIES OF THE COMMON ARTICHOKE.

We find among the thicket of dull and speculative essays that crowd the late numbers of the English Medical Journals, a few of rare practical value, which we shall not fail to transplant to our pages. At present we wish to ask the attention of the Faculty to the medical use recently made of the common artichoke. Several cases are detailed in the London Medical and Surgical Journal, in which rheumatic affections yielded very decidedly and speedily to the internal use of the juice of this plant.

The botanical name of this plant, as the reader well knows, is *cynara scolymus*. The *leaves* should be gathered before their vitality is affected by the frosts. The fibrous and fleshy portions of them should be cut into strips, and by bruising in a marble mortar the juice is readily extracted. In order to preserve this juice, one-fifth part of its weight of alcohol may be added to it, and in this way it is equally valuable for use, if not more so, than when wrought into the more expensive form of extract or tincture.

The efficacy of this medicine in rheumatism has been stated by several medical gentlemen within a few months, and we will content ourselves at present with offering the 1st and 4th of the cases last published, in the work before mentioned.

"The first case is of Elizabeth Harper, ætat. 75, a hale and strong woman, inhabiting a very exposed situation. On June 10th complained of acute pain in both wrists, which on examination I found to be painful on being touched, and very much tumefied; bowels very regular, free from fever; pulse 80; tongue clean; pain aggravated at night. Gave the following mixture:—R. Succi cynaræ, ʒiv. Syrup. simp. ʒij. Aq. font. ad. ℥vj. M. Capiat partem iv. am octavis horis.

11th. Pain much relieved; swellings slightly reduced; has passed a better night.—Continue medicine.

12th. Pain has ceased; swellings considerably less, and wrists no longer tender. A gentle aperient was to-day necessary.—*Cont. Mist. Cynaræ.*

14th. Quite well. The wrists have regained their proper size, and the hands their use. This patient continued quite free from pain until the

3rd of this month (August), when she complained of pain in one shoulder, similar to what she had felt at the wrists, and begged that she might have some more of such medicine as she had had on the former occasion. It was immediately sent to her, and she was relieved as before.

August 3rd. Samuel Fleur, ætat. 36, complains of considerable pain in his right shoulder, which prevents his taking any rest at night, when it appears to be slightly aggravated. Bowels confined; pulse 90, and tongue white. Gave—R. Magnes. Sulph. ℥iss. Syrup. Sim. ʒss. Aq. Menth. Pip. ad ℥vj. M. Capiat coch iij. mag. pro re natâ, secundis horis.

4th. Bowels relieved soon after finishing the mixture; pain in the shoulder unabated, limb incapable of being moved from extreme pain and stiffness; pulse 80.—R. Succi Cynaræ, ʒvj. Aq. Menth. Pip. ʒvj. M. Capiat part. iv. am nocte maneque.

5th. Relieved; pain in shoulder less; has slept for the first time for three nights.—*Perstet.*

7th. Gradually improving; bowels in good order; tongue clean, and pulse 70; shoulder less stiff.—*Perstet.*

12th. Is now so far recovered as to be able to go out to glean corn, and has discontinued medicine.

In more acute cases I have found the same medicine equally useful after bleeding, and in many cases where I had previously given the *Pulv. Ipec. c.*, antimonials, and the whole tribe of medicines usually esteemed in the treatment of this class of disease, without effect.

DANGER ATTENDING THE SOLITARY EXAMINATION OF FEMALE PATIENTS.

This is a subject which will doubtless be novel to the reader, and he will be lost in doubt wherein this danger consists. True it may be, and to every pure-minded man unquestionably is, a sunken rock. Lest, however, he should at any time be recked thereon, we will lay before him the following account, which we take from the London Medico-Chirurgical Review for the last month.

"It appears that a young woman, æt. 21, who had been in a bad state of health for two years, applied to Dr. Baird, physician to the Liverpool Infirmary, and, as we are informed, a practitioner of twenty years' standing, in the early part of last March. She was then suffering from debility, dyspnœa, constant thirst, occasional severe headaches, painful and irregular menstruation, frequent desire to make water, the legs and feet œdematous and painful, the veins of the right leg slightly varicose, and pains in the hip and thigh. Active remedies were several times prescribed, but no material benefit was obtained. About the end of March, she first showed the Doctor her heel, on which was a piece of thickened cuticle, resembling a corn. At the next visit the thigh having become swollen, in addition to the former symptoms, Dr. Baird proposed a private examination, to which the girl consented. The inguinal glands were found enlarged, but no uterine disease was discovered. At the present time the patient is nearly restored to health, after a continued course of alterative medicines, with digitalis, squills, and quinine.

Such is the statement of the case furnished by Dr. Baird. But this was not all. The girl, it would appear, related the circumstance of the examination to one of those elderly females who are found in or about most communities, and who generally prove a great blessing or a great curse to the generation of doctors. In the present instance, the veteran spinster excited some little hubbub, and the family complained of the indecency of the proceeding.

A gentleman, a reverend one, getting scent of this, complained to the Committee of the Liverpool Infirmary of the atrocious conduct of its physician, in examining the young woman. A junto of three, of which the reverend accuser was one, was delegated to inquire into the affair, and this impartial and well-qualified tribunal would seem to have "pronounced definitively against their officer," and even requested him to resign.

We will not stop to comment on the absurdity of much of the proceeding. The patient was not an infirmary patient, and, consequently, the case was not one for the jurisdiction of the reverend bench. If a man is condemned by the laws of his country for crime, or for any serious moral offence, the governors of an institution to which he may belong, are justified in taking steps to remove from among them one so unfitted for an honorable station. But that the rumor of a private faux pas, the mere suspicion of something wrong, should justify a public board in proceeding to hold a court martial on an officer of the establishment, is a measure so unjust, so inquisitorial, so monstrous in every point of view, that all of right feeling must turn from it with disgust. All who know the nature of medical reputation are aware that, to breathe on it the breath of suspicion, is often to taint it irremediably. The prejudices of mankind are concerned, and with prejudices it is vain to reason. What, then, must be the responsibility of those who could lightly lacerate the feelings, and perchance blast the fortunes, of a medical man, in subjecting him to an inquest of such a character on such an occasion! We do not envy them, and least of all that clerical inquisitor, at once the accuser and the judge.

Bad as the business is, it is calculated to teach an useful lesson. A female should never be examined unless another female be present. This precaution should never be overlooked by those who wish to escape the imputation to which Dr. Baird has been subjected."

Attitudes of Infants.—The flexed position of the extremities, and curvature of the trunk forwards, constitute the peculiar attitude of the new-born infant. Voluntary motion begins first in the upper extremities; and the hand, which at the beginning exercises prehension in a mechanical manner, becomes more and more able for its functions. The motions of the head, neck, trunk, and finally of the lower extremities, succeed in succession, so that the infant by degrees escapes from its state of inertia, and in proportion as its body is perfected, and its muscular power developed, acquires insensibly those attitudes which characterize the species. Thus we find all the functions of the animal economy directly depending on organization.

Color of the Integuments in Infants.—Infants at the time of birth have almost all a uniform color. Blood predominates in their tissues, and communicates its color to the body. From the fifth to eighth day this color diminishes, but it may remain longer, and no precise period can be mentioned as that of its disappearance. To the primitive red color may succeed many different shades. The integuments become rosy, white, or more or less yellow. Before becoming altogether white they have a general yellow or copper tint, considered by many to be the consequence of diseased liver, an opinion combated by some authors.

Exfoliation of the Epidermis in Infants.—This always takes place after birth, but at a very uncertain period. M. Billard's observations lead him to conclude, that from the third to fifth day it proceeds with the greatest activity, and that it is finished in a space of time varying from thirty days to two months. The cause of the exfoliation of the epidermis is this. The integuments of the child having been plunged for about seven months in a liquid which ought to keep them continually moist and supple, the *epidermis* is, as it were, soaked with the *liquor amnii* at the time of birth. Once exposed to the air, it suddenly becomes dry, and loses its suppleness. To this desiccation, which is not prevented by the cutaneous exhalation, is owing the cracking, scaling, and separation of the *epidermis*. The new *epidermis* is formed insensibly during the process of desquamation. In parts exposed to the air, this goes on with great rapidity, but in other situations more slowly, leaving the skin exposed in a very irritable state as on the scrotum, on the arm-pits, &c.

Edin. Med. and Surg. Journal.

Adhesion of the Placenta.—When the usual means for promoting the expulsion of the placenta have failed, some practitioners have recommended the injection of cold water through the umbilical vein.

This may act in two ways; either by stimulating the uterus, and thus exciting it to regular contractions, or by distending the cellular tissue of the placenta, and with it the constricted portion (we are talking of cases of the hour-glass contraction) of the womb. Before resorting to this expedient, we should try the simpler one, of merely immersing the extremity of the cord into cold water; the impression of the cold is thus transmitted to the walls of the uterus, and may induce them to sudden and healthy contractions.—*Archives Générales.*

There are a number of subscribers to the Medical Journal whom the Publishers regret that they are again obliged to remind of their delinquency. Those of their accounts which have been standing longest, were recently again forwarded, and it is hoped that these will be settled previous to the close of the year. There are many other accounts of a shorter date, the settlement of which, previous to the termination of the present Vol., is very desirable to the Publishers, and which they trust will receive an early attention from those concerned.

Whole number of deaths in Boston for the week ending December 13, 32. Males, 17—Females, 15.
Of croup, 1—infantile, 1—lung fever, 2—dysentery, 1—canker-rash, 1—consumption, 7—fits, 1—typhous fever, 5—paralytic, 1—unknown, 3—suicide, 2—canker in the bowels, 1—accidental, 2—dropsy on the brain, 1—scarlet fever, 1.

ADVERTISEMENTS.

Traité Théorique et Pratique des Maladies de la Peau.

A COPY of Rayer's valuable treatise on the diseases of the skin, may be had by application at the office of this Journal. The work consists of two volumes, 8vo. and a third volume of PLATES, containing 72 beautifully colored illustrations of the various forms of cutaneous disease. These volumes are handsomely bound, and the whole may be bought for $10.

THE BOSTON MEDICAL AND SURGICAL JOURNAL
IS PRINTED AND PUBLISHED EVERY WEDNESDAY, BY D. CLAPP, JR. AND CO.
At 184 Washington Street, corner of Franklin Street, to whom all communications must be addressed *Post-paid.* It is also published in Monthly Parts, on the 1st of each month, each Part containing the numbers of the preceding month, stitched in a cover.—Price $3,00 per annum in advance, $3,50 if not paid within six months, and $4,00 if not paid within the year.—*Postage the same as for a newspaper.*